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CALIPSO-Challenge with a Complex Project Structure

The Cloud Aerosol Lidar and Infrared Pathfinder Observatory, or CALIPSO, mission launched successfully on April 28, 2006. Since that time, it has begun receiving images through its innovative lidar technology. The ability of CALIPSO to observe the location, altitude, optical properties and movement of aerosols around the globe improves our ability to assess and forecast episodes of poor air quality.

During development, however, the CALIPSO mission wrestled with project management issues due to its complex project structure and partnerships. How does a project successfully navigate sharing responsibility and mission oversight between NASA Centers, for example? How does a project work successfully with international partners? This case study will explore how the CALIPSO team encountered, reacted to and then overcame these obstacles to achieve mission success.

Dale Schulz

Management Consultant

NASA Goddard Space Flight Center - Retired

Mr. Schulz received his bachelor degree in Electrical Engineering in 1968 from the Virginia Polytechnic Institute and State University and a masters degree in Electrical Engineering from the University of Maryland in 1972.

He began his career at NASA's Goddard Space Flight Center as a co-op student in 1964. Early in his career Mr. Schulz gained hardware and software experience developing ground support equipment for several of the Explorer series of missions. In 1976, he started to transition his career into management and became a Section Head in the Engineering Directorate.

In 1983 he transferred to the Flight Projects Organization where he worked a number of assignments supporting the development of various missions. In 1989 he became the X-ray Timing Explorer (XTE) Project Manager. In 1991 XTE was re-baselined by Mr. Schulz to be launched in 1995 with a cost capped budget, a first for the Explorer Program. XTE was launched in 1995 under budget in spite of being launched four months late due to launch vehicle problems. XTE has been quite successful. It was designed as a two-year mission and is continuing to provide exciting science. In May 1996 Mr. Schulz was assigned as the Project Manager for the New Millennium Program Earth Orbiter-1 (NMP EO-1) Project. The purpose of this mission was to flight validate revolutionary new Earth remote sensing technologies. A particularly challenging aspect of EO-1 was that a third instrument was added after the integration of the spacecraft bus had begun. Other challenges faced Mr. Schulz in getting EO-1 launched. EO-1 was one of the first missions to be launched after the Red Team Review process was initiated. As preparations for the Red Team Review were being made, the power converter in the data recorder failed. Mr. Schulz and his team overcame the setbacks



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and launched EO-1 successfully in November 2000. It achieved mission success in one year as planned. It is still being operated as an engineering test bed for such things as cloud cover detection algorithms and as a backup for the Landsat-7 satellite.

In 2001 Mr. Schulz was assigned as the acting deputy Landsat Data Continuity Mission Project Manager. The objective of the LDCM mission is to acquire Landsat data commercially from a contractor developed, owned, and operated system. Mr. Schulz led the procurement effort to purchase the data, which included developing two RFP's, one for the Formulation Phase and one for the Implementation Phase. In spite of a lot of effort with the source selection official it was not possible to negotiate acceptable contractual terms for a joint industry government remote sensing system and the procurement effort was terminated.

In 2003 Mr. Schulz took over the management of the Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observations (CALIPSO) mission. It was a joint NASA/CNES (French space agency) development effort. CALIPSO's polarization lidar instrument can detect aerosol particles and can distinguish between aerosol and cloud particles which will provide new insight into the global distribution and evolution of clouds that will lead to improvements in weather forecasting and climate prediction. Mr. Schulz initially had to resolve several team organizational problems resulting in a strong international team that successfully launched the satellite in 2006. It is continuing to provide outstanding aerosol and cloud height data.

Mr. Schulz retired in 2006 before CALIPSO could be launched and he continues to follow the operation of the mission in a consultation capacity; helping to resolve the few operational problems that have occurred since launch.

Edward Rogers
Chief Knowledge Officer
NASA Goddard Space Flight Center

Dr. Edward Rogers is currently the Chief Knowledge Officer at Goddard Space Flight Center. He has run the Knowledge Management Office at GSFC since 2003, where he set the course for Goddard's learning initiatives through the "Goddard Plan for a Learning Organization."

Some of the knowledge sharing activities he initiated include the popular Road to Mission Success Course, the Pause and Learn process, and case studies. Part of Dr. Rogers' responsibility is to support Goddard projects through enhancing individual and team learning to improve mission success.

Dr. Rogers received a Ph.D. from Cornell University's School of Industrial and Labor Relations focusing on the role of cooperation in high tech firms. In the early 1980s he performed five years of international relief work in Southern Lebanon. Prior to returning to academic work at Cornell, Dr. Rogers operated a private consulting business focused on knowledge workers and intelligent enterprise. His research work applies game theory



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models to human behavior in organizations. He has consulted with a number of organizations on building conceptual transparency and leveraging collective knowledge.

Before joining NASA he taught strategic management and entrepreneurship in the College of Administrative Science at the University of Alabama in Huntsville where he was known for his practical application of business knowledge.